

УДК 339.1

JEL Classification: L12

ASENOVA K.¹

LEAN PRODUCTION: MANAGEMENT INNOVATIONS INDUSTRIAL ENTERPRISE

DOI: <https://doi.org/10.32620/cher.2024.2.08>

Formulation of the problem. The main problem is that the implementation of lean production requires not only technical changes, but also significant transformations in the organizational culture of the enterprise. Many Kazakhstani industrial enterprises face difficulties in the integration of lean principles due to the low level of awareness of management and personnel, insufficient training of personnel, as well as resistance to change, which is characteristic of many organizations. *The purpose of the article* is to research innovative approaches to the management of industrial enterprises by implementing the principles of lean production, as well as to develop a methodology that would facilitate the effective application of these principles in practice. *The object of the study* is the management processes of industrial enterprises in the context of the implementation of the principles of lean production. *The methodological basis of the research* was the logical methods of information processing, statistical analysis, comparison. *The main hypothesis of the study* is that innovations in the management of industrial enterprises, based on the principles of lean production, ensure the effective functioning of the enterprise in the long term due to the integration of the latest management practices that take into account the specifics of the domestic market and available resources. *Presenting main material.* The study covers the study of existing management practices, personnel training methods, and organizational culture transformation necessary for the successful implementation of lean manufacturing. Lean manufacturing is a modern concept of production process management aimed at reducing costs, improving product quality, and satisfying consumer needs. This approach, which was developed in Japan, in particular at the enterprises of the Toyota company, is now widely used all over the world, including Ukrainian industrial enterprises. Implementation of the principles of lean production requires not only technical changes, but also significant transformations in the organizational culture of enterprises, which is a complex and multi-stage process. *Originality and practical significance of the research.* In practice, the successful implementation of lean manufacturing requires a comprehensive approach that includes both technical and organizational measures. One of the key aspects is the adaptation of the best global practices to the specifics of a particular enterprise. For example, heavy industry may require longer staff training and a more thorough approach to change planning. *Conclusions.* The implementation of lean production is a strategic step that allows to increase the competitiveness of the enterprise, to ensure its sustainable development and successful functioning in the conditions of the modern economy.

Keywords:

lean production, enterprises of Kazakhstan, production innovations, technical and organizational measures, reduction of management costs.

ОЩАДЛИВЕ ВИРОБНИЦТВО: ІННОВАЦІЇ УПРАВЛІННЯ ПРОМИСЛОВИМ ПІДПРИЄМСТВОМ

Постановка проблеми. Основна проблема полягає в тому, що впровадження ощадливого виробництва вимагає не лише технічних змін, але й суттєвих трансформацій в організаційній культурі підприємства. Багато казахстанських промислових підприємств стикаються з труднощами при інтеграції принципів lean через низький рівень обізнаності керівництва та персоналу, недостатню підготовку кадрів, а також опір змінам, що властивий багатьом організаціям. *Метою статті* полягає у дослідженні інноваційних підходів до управління промисловими підприємствами шляхом впрова-

¹ Асенова Канжегуль Калмуратовна, канд. екон. наук, доцент кафедри Менеджмент, Євразійський національний університет імені Л. М. Гумільова, м. Астана, Казахстан.

Asenova Kanzhegul, Ph.D. in Economic Science, associate professor of the Management Department, Lev Gumilyov Eurasian National University, Astana, Kazakhstan.

ORCID ID: <https://orcid.org/0000-0001-8655-7356>

e-mail: asenova.kk@enu.kz





дження принципів ощадливого виробництва, а також у розробці методології, яка б сприяла ефективному застосуванню цих принципів на практиці. *Об'єктом дослідження* є процеси управління промисловими підприємствами в контексті впровадження принципів ощадливого виробництва. *Методологічною основою дослідження* стали логічні методи обробки інформації, статистичний аналіз, порівняння. *Основна гіпотеза дослідження* полягає в тому, що інновації в управлінні промисловими підприємствами, засновані на принципах ощадливого виробництва, забезпечують ефективне функціонування підприємства в довгостроковій перспективі за рахунок інтеграції новітніх управлінських практик, які враховують специфіку вітчизняного ринку та наявні ресурси. *Виклад основного матеріалу.* Дослідження охоплює вивчення існуючих практик управління, методів підготовки персоналу та трансформації організаційної культури, необхідних для успішного впровадження ощадливого виробництва. Ощадливе виробництво (Lean manufacturing) є сучасною концепцією управління виробничими процесами, яка націлена на зменшення витрат, підвищення якості продукції та задоволення потреб споживачів. Цей підхід, який отримав свій розвиток в Японії, зокрема на підприємствах компанії Toyota, сьогодні знаходить широке застосування в усьому світі, включаючи українські промислові підприємства. Впровадження принципів ощадливого виробництва вимагає не лише технічних змін, але й суттєвих трансформацій в організаційній культурі підприємств, що є складним і багатетапним процесом. *Оригінальність та практичне значення дослідження.* На практиці, успішне впровадження ощадливого виробництва вимагає комплексного підходу, який включає як технічні, так і організаційні заходи. Одним з ключових аспектів є адаптація кращих світових практик до специфіки конкретного підприємства. Наприклад, на підприємствах важкої промисловості може знадобитися більш тривала підготовка персоналу та ретельніший підхід до планування змін. *Висновки.* Впровадження ощадливого виробництва є стратегічним кроком, який дозволяє підвищити конкурентоспроможність підприємства, забезпечити його стійкий розвиток та успішне функціонування в умовах сучасної економіки.

Ключові слова:

ощадливе виробництво, підприємства Казахстану, інновації виробництва, технічні та організаційні заходи, зменшення витрат управління.

Formulation of the problem. In today's conditions of globalization and fierce competition on world markets, industrial enterprises are faced with the need to increase the efficiency of their production processes. Traditional methods of production management often do not meet today's requirements, which forces us to look for new approaches to ensure competitiveness. Lean manufacturing is one of the most promising directions in the field of industrial enterprise management, based on the principles of cost reduction, product quality improvement, and maximum customer satisfaction.

The main problem is that the implementation of lean production requires not only technical changes, but also significant transformations in the organizational culture of the enterprise. Many Kazakhstan industrial enterprises face difficulties in the integration of lean principles due to the low level of awareness of management and personnel, insufficient training of personnel, as well as resistance to changes, which is characteristic of many organizations.

The relevance of this problem is determined by the need to develop and implement innovative management methods that

would contribute to increasing the competitiveness of Ukrainian enterprises in the international arena. In particular, it is important to identify the main obstacles on the way to the effective implementation of lean production, as well as to develop practical recommendations for overcoming them. In this context, special attention needs to be paid to the study of the best world practices and their adaptation to the conditions of domestic industry.

Analysis of the rest of the research and publications. For the first time, the term "Lean Production" (from the English phrase Lean Production) was used by J. Krafcik [1]. In foreign practice, the concept of lean thinking and production as one of the directions of management development has long been recognized. The problems of methodology and theoretical foundations of lean production were studied by such well-known authors as J. Vumek, D. Jones, M. Vader, O.E. Levy, T. Luyster, D. Tapping, M.L. George, H.M. Skudar and others. [2, 3, 4, 5, 6].

The purpose of the article is to study innovative approaches to the management of industrial enterprises by implementing the principles of lean production, as well as to develop a methodology that would facilitate the

effective application of these principles in practice.

Presentation of the main research material. Mastering lean production, understanding the logic of its concepts and re-education in the style of visions of the system is one of the main problems in overcoming resistance to its implementation. Also, it can be clearly stated that the successful implementation of the lean production system is impossible without the presence of highly qualified managers and specialists who possess knowledge, skills and abilities and meet the demands of tomorrow. And, first of all, it should be noted that the higher school in the educational process does not always have time to take into account modern trends in the development of the economy. So, for example, university graduates often come to production without systematic knowledge in the field of lean production, but studying the lean production system is extremely necessary as one of the new approaches in enterprise management. In addition, there is a necessary condition for the successful implementation of lean production - this is motivation, and precisely the appropriate remuneration.

A systematic presentation of the concept of "Lean production" is presented in the book by J. P. Wumek and D. T. Jones, where the essence of lean production is laid out in the form of five principles: determination of value; determination of the flow of value creation; organization of flow; extraction of products and/or services; continuous improvement (kaizen) [2].

In the management of the enterprise in the conditions of today's reality, the content of the basic principles of lean production acquires the following interpretation:

The first principle. The value of a product or service is created by the manufacturer, but can only be determined by the end consumer if the product is able to satisfy his needs for a certain price and at a certain time. At the same time, it is necessary to follow the following rules for determining the value: changes in the existing perception of the value of goods or services; establishing the desired value of the product; determining the value of the product from the point of view of the consumer; the need to constantly rethink the value of the product.

The second principle. A value creation stream, which involves the collection of all necessary production activities for a certain product to pass through three stages: designing a

certain product, placing an order for the manufacture of the product, manufacturing the product.

The third principle is the organization of the movement of the flow, which requires a rethinking of all work methods, types of equipment and tools so that nothing interferes with the continuous flow of design, ordering and production.

The fourth principle means that no one upstream should do anything until the consumer requests it. It is necessary to produce only what the consumer needs and only when he needs it.

The fifth principle suggests that as soon as the product's value creation flow is restructured, it is necessary to immediately think about the formation of a new vision of improvement that will follow, because no vision of perfection can be perfect.

It should be noted that the application of the principles of lean production allows you to freely change the sequence of operations from the processing of raw materials or semi-finished products into the final product and to immediately respond to changes in demand.

Determining the needs of the market and creating the maximum value for the client with the minimum expenditure of labor and production resources is the basis of the concept of lean production. In this case, elimination of all types of losses is assumed. M. Vader distinguishes seven types of losses: overproduction; defects and processing; movement; moving; stocks; excessive processing; expectations [3].

In the system of lean production, it is extremely important to understand the content of all types of losses in order to effectively overcome them in the current conditions of enterprise development.

Overproduction is the excessive production of products that did not find a consumer due to a change in demand or the presence of force majeure situations, such as, for example, the financial crisis of 2008-2009, when the consumer was forced to delay payment for the ordered products. The sources of losses in this case are: additional storage costs; overspending of raw materials, materials and excessive use of labor resources; disruption of delivery terms. To solve this problem, it is necessary at the enterprise to manufacture products only according to the order and exactly on time, or to provide for production in small batches in order to reduce the time of





reconfiguration of the equipment in case of changes in market demand.

Defects and rework (products requiring additional costs for repair or disposal or new manufacture). Sources of losses in the process of production of products that meet the requirements of the consumer are costs related to inspection and control operations for manufactured products. In this case, the way to improve the state of such losses is to conduct an analysis of the effectiveness of the functioning of units that control the quality of manufactured products in order to optimize costs. The release of products with deviations from the required quality causes additional costs for the correction of defects and defects or disposal. And this causes unnecessary additional costs for the purchase of raw materials, materials and labor costs. In order to reduce losses for production without defects, it is necessary to take measures to prevent the appearance of defects in a timely manner by increasing the efficiency and expediency of inspections, encouraging high-quality and punishing low-quality work, as well as incorporating quality control into the production process.

Movement or transportation (unnecessary movement of raw materials, products, materials). This is a necessary part of the production process in the form of transport maintenance costs (fuel and electricity, maintenance of roads and garages), as well as time for moving materials, tools and finished products in the sequence of operations for the production of finished products and the possibility of damage, the costs of which must be reimbursed. In order to reduce losses during transportation, it is necessary to eliminate unnecessary movements due to re-planning and redistribution of responsibility. And on the basis of the analysis of the expediency of each movement, create a matrix of optimal transport routes around the shop, the enterprise.

Movement - unnecessary movements (any movement of people, tools, equipment that is not directly related to production activities). Extra movements that lead to losses are the result of poor work organization. The source of losses is unnecessary transitions, movements, adjustments during the performance of work, which are caused by the lack of necessary instructions, weak training of employees and low labor discipline. As a way to reduce such losses, it is necessary to provide for the development of standards for the performance of work and the

implementation of the workplace organization system (5S).

Stocks in the usual sense are considered necessary in case of disruptions in the supply of raw materials and materials, and at the same time, they hide shortcomings in the organization of production, since their presence indicates a problem of balanced production and sales of products at the enterprise. It should be noted that stocks are frozen funds that do not participate in circulation and, thus, lose their value and lead to a decrease in value for the consumer. The main sources of losses are: maintenance costs of warehouses for raw materials, materials, semi-finished products and finished products; costs for the purchase of materials and semi-finished products that are at the stage of delivery. To improve this situation at the enterprise, it is necessary to constantly analyze: the state and dynamics of changes in stocks of material resources; timeliness of price changes for illiquid stocks; demand for products with a long shelf life. At the same time, it is also necessary to strengthen the control of planning, relations with suppliers, and the rhythm of production processes.

Redundant processing is processing that does not add value to the product. As a loss of excessive processing, there are costs associated with bringing products to the requirements and wishes of consumers (color, shape, configuration, style, etc.). Factors affecting the reduction of such losses, following: timely research of the need to improve products (purchase of raw materials and materials that do not require additional processing); ensuring appropriate product quality.

Waiting (downtime during working hours, which is associated with waiting for raw materials and materials, tools and equipment, documentation or information). Domestic enterprises are characterized by expected losses, which are connected with the fact that the processes of planning and production of products do not always agree with each other. The solution to this problem is facilitated by the organization of flexible production planning based on the availability of orders from a specific customer, and not for the general loading of equipment. In addition, a significant reason for the wait is the uneven capacity of the equipment, which must be solved by creating flexible work schedules for the equipment and employees.



Having determined the presence of losses in the production process, it is necessary to find ways to eliminate them. And in our opinion, an approach based on a mandatory and thorough understanding of the mechanism of formation of the consumer value of manufactured products will allow enterprises to reach a higher level of development and competitiveness.

Research in the field of improving management efficiency has shown that within the framework of the concept of lean production at the current stage of management development at domestic enterprises, such tools and methods are most often used as: kaizen - continuous improvement; the 5S system is a method of organizing effective workplaces; JIT (Just-in-time) system – a method of reducing production cycle time; kanban is a system that involves the use of shortcuts; SMED system – quick reconfiguration of equipment; TPM (Total Productive Maintenance) system – general equipment care; standard operating procedures – a document defining the sequence of any production operation; "built-in quality" is a method of managing the quality of products directly at the place of their production.

It is worth noting that it is fundamentally important to cover the entire activity of the enterprise in each direction of the concept, since in real business practice the above-mentioned methods are usually interconnected. That is why appropriate attention should be paid to their comprehensive implementation.

In order to ensure a permanent effect of activity on consumer markets, it is necessary to determine the correctness, first of all, of the chosen strategy of the priority direction of the enterprise's development. The past era is possible define as the time of mass production: sell what you produce, while the selling price was determined as the total result of profit and costs. The new era is the time of lean production: make what sells; profit is defined as the difference between the selling price and costs. So, in our opinion, frugality is not a luxury, but a means of survival. In this regard, it is necessary to define the features of the new time: teamwork; intensive, open exchange of information; efficient use of resources and exclusion of losses; continuous improvement.

According to the results of the study of lean production, it can be argued that its implementation does not require significant investments, but requires changes in the minds of employees, for which it is necessary to carry

out transformations in the organization: to introduce a new management culture; a new system of relations between units; new value orientation of employees and their relationships. We believe that for the successful practical implementation of the lean production system at the enterprise, it is necessary to adhere to the following provisions:

1) involve absolutely all employees of the enterprise in the process of implementing the system;

2) to conduct constant training of personnel and familiarization with the experience of the best domestic and foreign enterprises. It is important to have a certain explanation of the tasks and advantages of using the method in groups in the case of formation of training working groups. Those who have faced the implementation of the lean production method well understand how difficult it is to explain the advantages of new methods of work, and how difficult it is to get support for new methods from all those who must use them;

3) to build a system of effective motivation of employees, since in lean production 80% of the most important thing is personnel;

4) do not apply the lean production system without implementing the 5S methodology throughout the enterprise. It is also very important to foresee the parallel implementation of TRM, rapid changeover (SMED), tools of "built-in quality" and kaizen;

5) conduct training and development of its suppliers;

6) invite the best consultants with experience in the successful implementation of the lean production system.

Today, domestic enterprises can become competitive only if they ensure high product quality and low production costs, therefore eliminating losses is an urgent need to improve management organization. This means that at all stages of the search for sources of excess costs, it is necessary to honestly answer the question of where such costs come from and explain their nature, since the main law of lean production primarily requires honesty

Conclusions and prospects for further research. The main conclusions from the study can be structured:

1. The need to implement lean production. In the conditions of tough competition and globalization, industrial enterprises are faced with the constant need to improve the efficiency

of their production processes. Lean manufacturing is a promising approach that allows you to reduce costs, improve product quality and meet customer needs.

2. Basic principles of frugal production. The concept of lean is based on such key principles as continuous improvement (Kaizen), elimination of losses (Muda), provision of continuous flow (Flow), production according to the principle of "just-in-time" (Just-in-Time) and active involvement of all contributors to the improvement process.

3. Innovative approaches to implementation. Effective implementation of lean production requires a comprehensive approach, which includes analysis of the current state of production, development and implementation of a change plan, training and motivation of personnel, as well as the use of modern technologies for monitoring and optimization of production processes.

4. Problems and challenges. The main obstacles on the way to the implementation of lean are the low level of awareness of the management and employees, insufficient training of personnel, resistance to changes and the need to transform the organizational culture. To overcome these challenges, it is necessary to develop and implement a detailed action plan focused on the specifics of a particular enterprise.

5. Positive results. The experience of Kazakhstan and international enterprises shows that the implementation of lean production allows to achieve significant improvements in production processes. In particular, the amount of waste is reduced, the time of the production cycle is reduced, the quality of products is improved and the level of customer satisfaction is increased. In addition, employees become more involved in the improvement process, which contributes to the formation of a positive organizational culture.

6. Recommendations for enterprises. For the successful implementation of lean production, industrial enterprises need to: conduct regular analysis and diagnostics of production processes; provide training and staff training on lean principles and methods; implement modern

information systems for production monitoring; develop motivational programs that encourage employees to participate in the process of continuous improvement.

The implementation of lean production is a strategic step that allows to increase the competitiveness of the enterprise, to ensure its sustainable development and successful functioning in the conditions of the modern economy.

References

1. Krafcik, J. (2008). Triumph of the Lean Production System. *Sloan Management Review*, 1, 30.
2. Vumek, J. P. (2014). *Lean production. How to get rid of losses and achieve prosperity for your company*. Astana: Business Books, 473.
3. Vader, M. (2019). *Tools of lean production*. Pavlodar: Business Press, 124.
4. Luyster, T., Tapping, D. (2020). *Lean production: from words to action*. Astana: Standards and quality, 128.
5. George, M. L. (2015). *Lean Manufacturing + Six Sigma: Combining Six Sigma Quality with Lean Manufacturing Speed*. Almaty: Alpina, 360.

Список використаних джерел

1. Krafcik J. Triumph of the Lean Production System. *Sloan Management Review*. 2008. № 1. Р. 30.
2. Вумек Дж. П. Ощадливе виробництво. Як позбутися втрат і добитися процвітання вашої компанії. Астана: Бизнес Букс, 2014. 473 с.
3. Вэйдер М. Інструменти ощадливого виробництва. Павлодар: Бизнес прес, 2019. 124 с.
4. Луйстер Т., Теппинг Д. Ощадливе виробництво: від слів до справи. Астана : Стандарти и качество, 2020. 128 с.
5. Джордж М. Л. Бережливе виробництво + шість сигм: комбінуючи якість шести сигм зі швидкістю ощадливого виробництва. Алмати : Альпина, 2015. 360 с.

Стаття надійшла

до редакції : 20.03.2023 р.

Стаття прийнята

до друку: 28.06.2024 р.

Бібліографічний опис для цитування :

Asanova K. Lean production: management innovations industrial enterprise. *Часопис економічних реформ*. 2024. № 2 (54). С. 71–76.

